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The MONITOR

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Volume 8, No. 5 & 6 **Special Edition**

Interview With Ms. Maureen Koetz - Air Force Deputy Assistant Secretary for Environment, Safety, and Occupational Health...

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The MONITOR is a quarterly publication of the Headquarters Air Force Materiel Command (AFMC) Pollution Prevention Integrated Product Team (P2IPT) dedicated to integrating environment, safety, and health related issues across the entire life cycle of Air Force Weapon Systems. AFMC does not endorse the products featured in this magazine. The views and opinions expressed in this publication are not necessarily those of AFMC. All inquiries or submissions to the MONITOR may be addressed to the Program Manager, Mr. Frank Brown.

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ACQUISITION & LOGISTICS EXCELLENCE -- EXACTLY!

Dr. James G. Roche, Secretary of the Air Force
Excerpts of Remarks for the Acquisition and Logistics Excellence Day,
Wright-Patterson Air Force Base, OH, October 21, 2002

"We are now engaged in the first war of the 21st century — a global war against terrorism.……

……While the war on terror presents many challenges, the future has never been brighter for airmen. We are entering a new age of air and space power. An age that goes beyond the promise of airpower theorists who predicted many years ago the critical role the airplane would have in waging war. For us, it is air and space power — and it is remarkable capability we deliver to our nation.……

"WITH SPIRAL DEVELOPMENT, WE'LL BRING THE OPERATOR, THE SCIENTISTS, THE ACQUIRERS, THE TESTER, THE BUDGET PLANNERS AND THE LOGISTICIANS TOGETHER FROM THE START TO DEVELOP REALISTIC, INCREMENTAL AND DISCIPLINED PLANS TO DELIVER NEW CAPABILITY TO THE WARFIGHTER AS QUICKLY AS POSSIBLE, AND THEN TO DO PRODUCT IMPROVEMENT."

……In developing and delivering future systems, we can no longer treat requirements, acquisition and sustainment as isolated or independent processes. We must build strong, enduring partnerships between our warfighters and our acquisition and sustainment professionals. We also must seek out every way to draw on the knowledge base in the private sector — including non-defense industries. Ultimately, we must ensure our warfighters have the tools they need, when they need them.

……The foundation of our new approach requires we establish collaborative spiral development as the preferred way of doing business. With spiral development, we'll bring the operator, the scientists, the acquirers, the tester, the budget planners and the logisticians together from the start to develop realistic, incremental and disciplined plans to deliver new capability to the warfighter as quickly as possible, and then to do product improvement.

We need to change the mindset that currently opposes delivery of a product until we have the 100-percent solution. Instead, we must work to understand the trade-offs that must be made to ensure capability is delivered as soon as practicable and to ensure each successive spiral — even if it is not fully defined at the outset — will bring increased capability…..

At the same time, we must improve our ability to estimate both costs and schedules, and greatly reduce the number of program surprises that undermine confidence in our programs and disrupt our progress.

"SECRETARY (OF DEFENSE DONALD) RUMSFELD IS VERY SERIOUS ABOUT THE BUSINESS OF TRANSFORMATION. THE AIR FORCE AND OTHER SERVICES HAVE BEEN FORCED TO DEFEND BUDGET DECISIONS — AND RIGHTLY SO — TO ENSURE THEY SUPPORT THIS NEW FOCUS."

……To adapt correctly to this new strategic environment, our principle focus has been on transitioning from a platform-based garrison force to a capabilities-based expeditionary force. We need to make warfighting effects and the capabilities we need to achieve them the driving factors for everything we do.

This is a very important point. We're using our task force concepts of operation as the principal tool to make this absolutely essential shift. I want everyone in the business of inventing, developing, building, purchasing and sustaining to understand this concept. The CONOPS are the foundation of our transformation efforts.

…….Secretary (of Defense Donald) Rumsfeld is very serious about the business of transformation. The Air Force and other services have been forced to defend budget decisions — and rightly so — to ensure they support this new focus. If we can't build effective systems that support this strategy, while controlling costs, then shame on us for not getting it done.

General Jumper and I view adapting our Air Force to this century as one of our principal missions. We're focused on how we intend to shape our force so it's poised for the future — not for the century we left behind.…...

Source: http://www.af.mil/news/speech/sph2002_18.html

AIR FORCE MODERNIZATION AND TRANSFORMATION

Major General David A. Deptula, USAF

Air Force modernization is based on revolutionary trends first glimpsed in the Gulf War, the deployment challenges of the post-Cold War environment, and our projections about the future security environment. In order to turn those trends, challenges, and projections into reality, the Air Force has instituted a comprehensive, corporate-style process for tying our vision to the future security environment. It is a process that allows for creativity by focusing not on platforms, but on requirements for future capabilities. Good ideas from laboratory projects, war games, experimentation, actual combat, and a variety of other venues feed into our strategic-planning process and are distilled into 14 "critical future capabilities". The programming process then filters programs through those critical capabilities to ensure that the Air Force is staying on course.

The Air Force's 14 Critical Future Capabilities

1. Rapidly dominate (within days) adversary air defenses to allow freedom to maneuver, freedom to attack, and freedom from attack.
2. Render an adversary's cruise and ballistic missiles ineffective before launch or soon after.
3. Protect our space assets and deny an adversary space capability.
4. Create desired effects within hours of tasking, anywhere on the globe, including locations deep within an adversary's territory.
5. Provide deterrence against both coercion and attack from weapons of mass destruction by maintaining a credible, land-based nuclear and flexible conventional strike.
6. Create precise effects rapidly, with the ability to retarget quickly, against large, mobile, hidden, or underground target sets anywhere, anytime, in a persistent manner.
7. Assess, plan, and direct aerospace operations anywhere in near real time, tailored across the spectrum of operations and levels of command.
8. Provide continuous, tailored information within minutes of tasking with sufficient accuracy to engage any target in any battle space worldwide.
9. Ensure our use of the information domain, unhindered by all attempts to deny, disrupt, destroy, or corrupt it; also ensure our ability to attack and affect an adversary's information in pursuit of military objectives.
10. Provide the airlift, aerial refueling, and en route infrastructure capability to respond within hours of tasking to support peacetime operations or a crisis.
11. Build an aerospace force that enables robust, distributed military operations with time-definite sustainment.
12. Build a professional cadre to lead and command expeditionary aerospace and joint forces.
13. Implement innovative concepts to ensure we recruit and retain the right people to operate our aerospace force in the future.
14. Achieve an unrivaled degree of innovation founded on integration and testing of new concepts, innovations, technologies, and experimentation.

Source: PIREP, Fall 2001 http://www.airpowermaxwell.af.mil/airchronicles/apj/apj01/fal01/phifal01.html

WEAPON SYSTEM POLLUTION PREVENTION CHALLENGE ADDRESSING AFFORDABILITY AND READINESS

Affordability and readiness concerns of an aging aircraft inventory drive the need to integrate Environment, Safety and Health (ESH) into weapon system acquisition. Weapon systems drive 80% of Department of Defense's (DoD's) hazardous material (HAZMAT) usage and each $1 of HAZMAT used drives $80 of associated life cycle costs.

The overall acquisition process includes the requirements definition, planning, programming, budgeting and program management processes that take Air Force systems from concept exploration through to disposal. Since 1993, the Air Force ESH community has been integrating weapon system pollution prevention (WSP2) into these processes. The challenge today is in over 300 systems and end items that are managed by less than 100 Single Managers. Although the Single Managers have engineering control over these systems' design and maintenance processes, it is the installation ESH and Logistics personnel that are the most aware of the weapon systems' ESH costs and risks at installations. In order for ESH needs to compete with the traditional weapon system requirements for prioritization and funding, the WSP2 community should focus on collecting cost data to help defend the ESH requirements. Future resource constraints within the Air Force dictate that we no longer just concentrate on reducing pollution, but also on reducing cost.

Source: Sherman Forbes, SAF/AQRE from historical issues of The MONITOR.

		AF Personnel		Weapon System Inventory						
MAJCOM	Flying Hrs/Month	Active Duty	Reserve	Fighters	Trainers	Other	Transport	Bombers	Tankers	Helicopters
Air Education and Training Command	46748	69237	7790	211	978	SOF - 12	56	211	24	7
Air Combat Command	30160	84948	58136	687	30	105		130	17	32
Air Mobility Command	29600	49469	82938			Helicopters 15	320		222	15
Pacific Air Forces	10109	31559	4671	264		Recon - 2	39		12	8
US Air Forces in Europe	7500	26332	388	173			36		15	
Air Force Special Ops Command	4700	9057	2532			SOF - 74	3			2
Air Force Materiel Command	1800	23781	5547	50	17		26	3	4	5
Air Force Space Command		19438	1331			ICBs – 550 Satellite Systems - 43				18
Total	130617	313821	163333	1385	1025	801	480	344	294	87

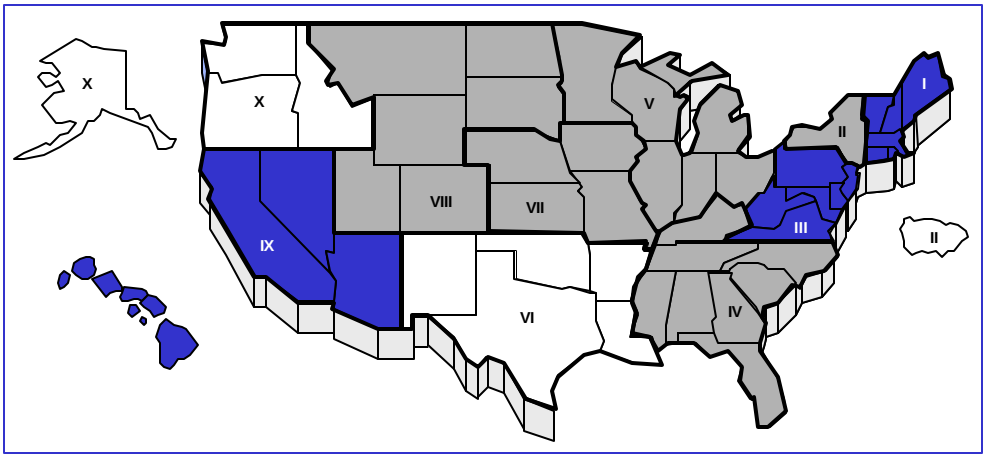
Source: Air Force Magazine, May 2002.

Overview of the Department of Defense (DoD) Regional Environmental Offices

In accordance with DoD Instruction 4715.2, "DoD Regional Environmental Coordination", the Military Services have established and located regional offices and DoD Regional Environmental Coordinators (RECs) based on standard federal EPA regions.

The Air Force, which has had regional environmental offices since the mid-1970s is designated as the DoD RECs for Region II, VI, and X. The Navy established regional offices in October 1990 and is then designated DoD REC for Regions I, III, and IX in July 1994. The Army established their regional offices in 1995, including their four DoD REC offices in Regions

DoD REC Regions



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National Emission Standards for Hazardous Air Pollutants (NESHAP) Final Rule Update

On February 28, 2003, the EPA Administrator signed fourteen (14) National Emission Standards for Hazardous Air Pollutant (NESHAP) Final Rules**.** Nine (9) of these rules were not tracked by the DoD Clean Air Act Services Steering Committee (SSC), since they had no potential application to military processes. However, for the remaining five (5) NESHAPs, the DoD SSC, has been instrumental in ensuring the minimal impact of these regulations to DoD operations.

Two (2) of the NESHAP Final Rules, which include the Metal Furniture (Surface Coating) and the Printing, Coating, and Dyeing of Fabrics and Other Textiles NESHAPs, have a specific exemption for operations performed on military installations. The Wood Building Products (Surface Coating) NESHAP Final Rule exempts facility construction & maintenance operations, which would be the primary operation within DoD subjected to this regulation. Additionally, it has a low use exemption (less than 1,100 gallons per year), and any other potential operation within DoD will likely fall below this usage.

Two (2) of the final rules, the Engine Test Facility and the Reinforced Plastic Composites (RPC) NESHAPs may have some impact on military operations and are further discussed on page 16.

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IV, V, VII and VIII. The current Environmental Executive Agents for the Military include Ms. Maureen Koetz (Air Force), Mr. Donald Schregardus (Navy) and Mr. Ray Fatz (Army).

The mission of the DoD RECs include the following:

- Coordinate region-wide issues with other Service regional offices.
- Provide review, analysis, and comment on proposed and existing state regulations and legislation.
- Facilitate partnering with states by articulating DoD/ Military Service positions, where appropriate
- Publicize and share success stories and innovations.

The DoD RECs provide a key link in the communication process between the Military Services, the states, and federal agencies. The DoD RECs give a voice to environmental constraints that may impact mission readiness.

Department of the Army

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DoD REC Region I

Commander Navy Region Northeast
Naval Submarine Base New London
Box 101 CODE N8
Tautog Ave., Room 107 Groton, CT 06349-5101
Phone: (860) 694-3976 DSN 694-3976
Fax: (860) 694-5339

DoD REC Region II

HQ Air Force Center for Environmental Excellence
Eastern Regional Office
ATTN: AFCEE-CCR-A
60 Forsyth Street SW, Suite 8M80
Atlanta, GA 30303-3416
Phone: (404) 562-4200
Fax: (404) 562-4221

DoD REC Region III

Navy Public Works Center, Code 910
Regional Environmental Group
9742 Maryland Avenue
Norfolk, VA 23511-3095
Phone: (757) 444-3009 x369 DSN 564-3009 x369
Fax: (757) 444-3000

DoD REC Region IV

Southern Regional Environmental Office
ATTN: SFIM-AEC-SR
430 Tenth Street NW, Suite S-206
Atlanta, GA 30318-5768
Phone: (404) 347-1570 x277
Fax: (404)347-1577

DoD REC Region V

US Army Environmental Center
Northern Regional Environmental Office
ATTN: SFIM-AEC-NR
5179 Hoadly Road
Aberdeen Proving Ground, MD 21010-5401
Phone: (410) 436-2427 DSN 436-7110
Fax: (410) 436-7110

DoD REC Region VI

US Air Force Center for Environmental Excellence
Central Regional Office
525 S. Griffin Street, Suite 505
Dallas, TX 75202-5023
Phone: (214) 767-4650
Fax: (214) 767-4661

DoD REC Region VII

US Army Environmental Center
Central Regional Environmental Office
ATTN: SFIM-AEC-CR
601 East 12th Street, Suite 647
Kansas City, MO 64106-2896
Phone: (816) 983-3548
Fax: (816) 426-7414

DoD REC Region VIII

US Army Environmental Center
Western Regional Environmental Office
ATTN: SFIM-AEC-WR
Rocky Mountain Arsenal, Bldg 11
Commerce City, CO 80022-1748
Phone: (303) 289-0260/0517
Fax: (303) 289-0272

DoD REC Region IX

Commander Navy Region Southwest
Environmental Department, N45 (REC)
937 N. Harbor Drive
San Diego, CA 92132-5100
Phone: (619) 524-6388
Fax: (619) 524-6349

DoD REC Region X

US Air Force Center for Environmental Excellence
Western Regional Office
ATTN: AFCEE/CCR-S
333 Market Street, Suite 625
San Francisco, CA 94105-2196
Phone: (415) 977-8849
Fax: (415) 977-8900

DoD REC Region IV

Southern Regional Environmental Office
ATTN: SFIM-AEC-SR
430 Tenth Street NW, Suite S-206
Atlanta, GA 30318-5768
Phone: (404) 347-1570 x277
Fax: (404)347-1577

If you would like historical issues of The MONITOR on compact disk (November 1996 - Summer 2002), please contact Frank Brown by e-mail: Frank.Brown@wpafb.af.mil

AN INTERVIEW WITH MS. MAUREEN KOETZ, AIR FORCE DEPUTY ASSISTANT SECRETARY FOR ENVIRONMENT, SAFETY, AND OCCUPATIONAL HEALTH

Ms. Maureen Koetz serves as the Air Force Deputy Assistant Secretary for Environment, Safety, and Occupational Health (ESOH). She provides executive leadership and direction to the development and implementation of integrated Air Force ESOH Program. Her responsibilities include ensuring Air Force compliance with existing statutory and regulatory requirements promulgated by the Environmental Protection Agency and the Department of Labor. She also represents the Air Force in testimony before congressional committees on legislative, government operations, and appropriations matters, as they relate to installation management.

MONITOR: What are some of the specific authorities designated to Secretary of the Air Force, Environment, Safety and Occupational Health (SAF/IEE)?

MS. KOETZ: The new Administration saw the benefit of integrating Installation, Logistics, and Environment under one entity and this resulted in the formation of SAF/IE. The logistics community is responsible for a large portion of the business activities covered by ESOH policy and therefore are a key partner in our processes.

SAF/IEE
DSN 227-9297 • Commercial: 703-697-9297

Ms. Maureen Koetz: Deputy Assistant Secretary (DAS) (ESOH)
Lt Col Barbara Larcom: Principal Deputy
Mr. Robert McCann: ESOH Corporate Process
Mr. Vance Lineberger: Safety and Occupational Health
Col Richard Ashworth: ESOH Integration
Col Lewis Wolf: Encroachment
Lt Col Jeff Cornell: Environmental Restoration
Maj Sharon Spradling: Environmental Quality

The responsibilities of SAF/IEE include integrating ESOH into AF Policy, providing oversight to Environmental Programs (compliance, restoration, conservation, and pollution prevention), and integrating environment, range, airspace, and community planning to ensure necessary operational capability. We see ESOH policy as a key factor in transformation on the business side of the house. Generally we have managed ESOH policy to meet regulatory requirements. As we transform, ESOH policy will refocus management to mission requirements. This entails understanding our ranges and installations as a set of multi-dimensional resources, which must be capable of supporting the mission. Natural resources controlled by statute and regulation, such as water supply, air emission allowances, ground safety set-backs and buffers, etc. must be sized and managed to support operational needs the same as our infrastructure. When our resource base is impacted by various activities such as zoning actions and environmental permit limitations, these activities may result in operational and/or financial risks to our resources and capability to conduct the necessary AF mission. Preventing this encroachment is now a key factor of our forward planning.

"NATURAL RESOURCES CONTROLLED BY STATUTE AND REGULATION, SUCH AS WATER SUPPLY, AIR EMISSION ALLOWANCES, GROUND SAFETY SET-BACKS AND BUFFERS, ETC. MUST BE SIZED AND MANAGED TO SUPPORT OPERATIONAL NEEDS THE SAME AS OUR INFRASTRUCTURE."

MONITOR: What are some of the key initiatives that your organization is currently involved with?

MS. KOETZ: In addition to encroachment, one of our key initiatives is to explore how we can integrate the AF's Environmental Program into the Pentagon's long-range Planning programming and budget process. This effort requires two critical components. The first is to be able to document operational and financial risks that must be managed to sustain the environmental resource base. The second critical component, which I term as "in-reach", requires conducting ESOH awareness to help the AF understand the total obligation authority (TOA) dedicated to ESOH today and potential operational savings associated with a streamlined ESOH Program. In order to communicate this message, we need to identify and document where we are incurring ESOH costs.

"THE MILITARY'S ENVIRONMENTAL PROGRAMS ARE OFTEN VIEWED IN ISOLATION FROM LONG-RANGE BUDGET PLANNING BECAUSE BROADER RISKS ARE NOT ALWAYS CALCULATED AND EFFECTIVELY COMMUNICATED."

The military's environmental programs are often viewed in isolation from long-range budget planning because broader risks are not always calculated and effectively communicated. Although the Air Force has historically focused on environmental risk from a perspective of non-compliance and the associated penalties, there are also increased regulations and lack of sustainment. For example, losing military training areas access can be limited due to excessive contamination that must be cleaned. Financial risks include increased cost to transport military personnel to distant ranges, if local access to ranges is lost.

As a part of our successful "in-reach" ESOH Awareness, we need to know where we are incurring environmental costs. I don't believe that today we have an accurate assessment of these costs. Potential areas to review include the dedicated environmental budget, O&M, MILCON, Contract (G&A) suppliers, and support agency budgets like DLA. Capturing and communicating these costs will help with understanding TOA, and the lessons learned in life cycle management of these costs can help reduce next generation costs.

MONITOR*:* What do you see as some of the challenges as you implement your key initiatives?

MS. KOETZ: One of our challenges is to get a true understanding of the cost effectiveness of ESOH programs. For example, Hill AFB is developing lasers to remove paint. Investing in such programs can be more widespread if we show both environmental benefits and return on investment. This will truly help benefit the policy process and we need experts in the field to help us evaluate cost effectiveness.

From a policy perspective, our biggest challenge is how to translate the risks and costs associated with ESOH requirements into mission impact. ESOH statutes and regulations are in place to mitigate risks our society does not want to take. Statues/regulations manage societal risks by setting standards and designating the party to incur costs of risk mitigation. In profit making corporations, these costs start to show up in the bottom line and this is how they are managed. In the Air Force, the bottom line is mission, but we still incur costs. From an ESOH policy perspective, we want to manage ESOH risk as cost-effectively as possible.

MONITOR: Are there any opportunities to migrate some of your successful experiences from the nuclear industry to the challenges of your current position?

MS. KOETZ: Much like the military, the nuclear industry has made tremendous investments to meet ESOH goals. For example, as an advanced technology, nuclear internalized the cost of eliminating air/

water emissions and established Environmental Management Systems (EMS) decades ago. However, the value of these investments did not show up in the accounting practices. The value of this investment to society, customers, and shareholders was not effectively accounted for in the electricity markets. During my time with that industry, I successfully assisted in integrating the value of environmental management into operations and the bottom-line.

We have a similar situation in the AF regarding our resource base. The value of our ESOH investment is not always apparent, and the potential cost if ESOH assets are not sustained is not always understood. We hope to show the ESOH value to the mission bottom-line.

MONITOR: You have often talked about the importance of helping the operators understand that environmental permits and compliance with all applicable regulations represent a "license to operate". Can you further expand on this concept? You have also stressed the importance of expanding our notion of risk to include the operational and financial consequences – can you further expand on this concept?

MS. KOETZ: The environmental laws have a major economic underpinning - they create scarcity, which drives up value. This scarcity is accomplished by requiring permits to access resources like air and water. Because we need permits for most of our operational systems (drinking water, wastewater, air emissions, hazardous materials), they represent valuable access to resources we need to operate. Without these permits, we cannot accomplish the mission.

"AS WE PERFORM OUR MISSION WE NEED TO MANAGE OUR RESOURCES, INCLUDING OUR ENVIRONMENTAL ASSETS, TO THEIR PROPER CAPABILITY AND CONDITION – THIS IS KEY TO OUR ENVIRONMENTAL TRANSFORMATION."

The next evolution in this concept is to understand that maintaining our environmental resources is just like maintaining our infrastructure base. These resources and permits to access them are like land, built runways, and hangers; they give us the ability to operate.

In the end, a secure defense is the first line of environmental protection. As we perform our mission, we need to manage our resources, including our environmental assets, to their proper capability and condition – this is key to our environmental transformation.

MONITOR: How can the weapon system community better work with your office to address beddown issues at the installations? How can they support you in your efforts to promote the notion of "environmental capacity" as an asset at your installation?

MS. KOETZ: We hope to integrate environmental resource requirements into the weapon system process more effectively. Right now, we tend to look at the environmental process in weapons development as a function of impacts to be mitigated. We want to transform our understanding so that we calculate the level of environmental resource a weapon system will require. Then, the AF can make informed decisions about whether the resource is available, can be acquired or the system adjusted to reduce need. For example, air emissions need air shed access. This represents a specific requirement from the resource base. So during beddown, air shed availability can be considered as a resource requirement and decisions made accordingly. To facilitate proper planning and budgeting for these requirements, the weapon system can assist in identifying these resource requirements upfront to the Air Force.

MONITOR: What would you say to the Air Force Pollution Prevention Specialist in how s/he can facilitate change at the local level with a global perspective?

MS. KOETZ: Tie your activities to cost and resource requirements. The environmental architecture starts with environmental conservation followed by pollution prevention. As our environmental resource capabilities become impacted we find the most cost-effective way to ensure continued resource capability and access is to internalize the pollution control cost at the early stage of the lifecycle.

ACQUISITION RESPONSIBILITIES IN THE ENVIRONMENTAL, SAFETY, AND OCCUPATIONAL HEALTH MANAGEMENT SYSTEM (ESOH MS)

Environmental, Safety, and Occupational Health (ESOH) issues are an integral part of the core mission areas' overall planning, execution, and review responsibilities. ESOH risks include, but are not limited to, the following:

- Potential for ESOH requirements or hazards to impact mission capability
- Potential for damage to personnel (injury or illness), the environment, or to equipment
- Failure to comply with environmental, safety, or occupational health requirements

In today's new strategic environment, core mission areas must use an integrated, cost-effective, risk-based ESOH management system (MS) approach to enhance the development and employment of aerospace power. There are several critical components involved in the successful implementation of an ESOH MS at all levels of command in the Air Force. These critical components included the following:

- Senior leadership involvement;
- ESOH performance measurement and goals;
- Accountability; and
- A structured management review process.

An ESOH MS should build on and connect the existing Environmental (E), Safety (S), and Occupational Health (OH) programs, and integrate them with the core mission areas to focus on enhancing mission accomplishment. In this framework E, S, and OH organizations provide support to the core mission areas' management of ESOH performance, rather than serving as the "owners" of ESOH performance. ESOH MS implementation does not require the restructuring or realignment of existing E, S, and OH organization or the reallocation of resources between the E, S and OH pillars.

The ESOH MS AF Instruction (AFI) being developed by SAF/IEE also makes improvements to Acquisition ESOH management. The AFI includes ESOH as a mandatory element for all acquisition program reviews. Each program review must address the following topics.

- Status of identified system ESOH risks
- National Environmental Policy Act (NEPA) completion schedule for the full life-cycle of the system
- System mishap trends and mitigation measures since the last program review

Additionally, the AFI also directs the individual E, S, and OH functional offices at MAJCOM Headquarters to assign a top priority to the support of Operational Requirements Document (ORD) development to ensure the identification of appropriate, system-specific ESOH performance requirements.

For further information regarding the development of the ESOH MS AFI, please contact Mr. Vance Lineberger, SAF/IEE at DSN 223-7706.

AIR RESOURCES: SUMMARY OF ATTAINMENT STATUS AT AIR FORCE INSTALLATIONS

A variety of air pollutants are regulated under different mechanisms of the federal Clean Air Act (CAA). Criteria pollutants are those for which National Ambient Air Quality Standards (NAAQS) have been established because of their adverse effects on health and welfare. The criteria pollutants are nitrogen oxides (NO_x); sulfur oxides (So_x); carbon monoxide (CO); lead; ozone, which is formed by photochemical reactions in the lower atmosphere from volatile organic compounds (VOCs) and NO_x; and PM, or particulate matter. PM-10, or particles smaller than 10 micrometers (mm), are regulated; previously, total suspended particulates (TSP) were regulated; new regulations will regulate PM-2.5, or particles smaller than 2.5.

Facilities as a whole and emission changes at facilities may be required to apply air pollution emission controls, conduct ambient air quality impact modeling, or obtain emissions offsets. The trigger levels and requirements of these regulations vary depending on whether or not the area is attaining the NAAQS and may vary to some degree from state to state. The attainment status for these criteria pollutants at AF Installations is provided on pages 13 to 15 and may be used as one factor for determining airspace requirements for current and future weapon systems. All activities need to be also coordinated with state and local government air permitting authorities.

Listing of State Environmental Regulatory Agencies

State	Web Site	State	Web Site
Alabama	http://www.dcnr.state.al.us/index.htm	Montana	http://www.dnrc.state.mt.us/
Alaska	http://www.state.ak.us/local/akpages/ENV.CONSERV/home.htm	Nebraska	http://www.deq.state.ne.us/
Arizona	http://www.adeq.state.az.us/	Nevada	http://www.state.nv.us/cnr/
Arkansas	http://www.adeq.state.ar.us/	New Hampshire	http://www.dcnr.state.al.us/index.htm
California	http://www.calepa.ca.gov/	New Jersey	http://www.state.nj.us/dep/
Colorado	http://www.dnr.state.co.us/	New Mexico	http://www.nmenv.state.nm.us/
Connecticut	http://dep.state.ct.us/	New York	http://www.dec.state.ny.us/
Delaware	http://www.dnrec.state.de.us/DNREC2000/	North Carolina	http://www.enr.state.nc.us/
Florida	http://www.dep.state.fl.us/	North Dakota	http://www.health.state.nd.us/ndhd/default.asp
Georgia	http://www.ganet.org/dnr/	Ohio	http://www.epa.state.oh.us/
Hawaii	http://www.hawaii.gov/dlnr/Welcome.html	Oklahoma	http://www.deq.state.ok.us/
Idaho	http://www2.state.id.us/deq/	Oregon	http://www.deq.state.or.us/
Indiana	http://www.state.in.us/idem/	Pennsylvania	http://www.dep.state.pa.us/
Illinois	http://dnr.state.il.us/	Rhode Island	http://www.state.ri.us/dem/
Iowa	http://www.state.ia.us/government/dnr/index.html	South Carolina	http://www.state.sc.us/dhec/
Kansas	http://www.kdhe.state.ks.us/	South Dakota	http://www.state.sd.us/denr/denr.html
Kentucky	http://www.nr.state.ky.us/nrepc/dep/dep2.htm	Tennessee	http://www.state.tn.us/environment/
Louisiana	http://www.deq.state.la.us/	Texas	http://www.tnrcc.state.tx.us/
Maine	http://www.state.me.us/doc/dochome.htm	Utah	http://www.eq.state.ut.us/
Maryland	http://www.mde.state.md.us/	Vermont	http://www.anr.state.vt.us/
Massachusetts	http://www.state.ma.us/dep/	Virginia	http://www.deq.state.va.us
Michigan	http://www.deq.state.mi.us	Washington	http://www.wa.gov/dnr/
Minnesota	http://www.moea.state.mn.us/	West Virginia	http://www.dep.state.wv.us/
Mississippi	http://www.deq.state.ms.us/	Wisconsin	http://www.dnr.state.wi.us/
Missouri	http://www.dnr.state.mo.us/homednr.htm	Wyoming	http://deq.state.wy.us/

Attainment Status for Criteria Pollutants at AF Installations

				NAAQS Attainment (Y) /NonAttainment (Value)							
Base	**State**	**MAJCOM**	**Weapon System**	**CO Y < 9ppm**	**Lead Y< 1.5**	**NO2 Y < 0.053ppm**	**Ozone 1-hr Y < 0.12ppm**	**Ozone 8-hr ppm ND=Not detected or no data**	**PM-10 Y < 50ug**	**PM-2.5 Y < 15ug**	**SO2 Y < 0.14ppm**
Eielson AFB	AK	PAF	A-10A, OA-10A, F-16C, F-16D	N (30)	Y	Y	Y	ND	Y	Y	Y
Elmendorf AFB	AK	PAF	C-12, C-130H, E-3B, E 3C, F-15C, F-15D, F-15E	N (30)	Y	Y	Y	ND	Y	Y	Y
Maxwell AFB	AL	AETC	—	Y	Y	Y	Y	ND	Y	Y	Y
Little Rock AFB	AR	AETC, AMC	C-130E, C-130	Y	Y	Y	Y	0.087	Y	N (15.9)	Y
Davis–Monthan AFB	AZ	ACC, AFMC	A-10, OA-10, EC-130E, EC-130H	Y	Y	Y	Y	ND	Y	Y	Y
Luke AFB	AZ	AETC	F-16	Y	Y	Y	Y	ND	Y	Y	Y
Lajes Field	AZORES	ACC	—							Y	
Beale AFB	CA	ACC	T-38, U-2	Y	Y	Y	Y	ND	Y	Y	Y
Edwards AFB	CA	AFMC	—	Y	Y	Y	N (0.13)	0.109	N (49)	N (21.8)	Y
Travis AFB	CA	AMC	C-5, KC-10	Y	Y	Y	N	ND	Y	Y	Y
Vandenberg AFB	CA	AETC, AFSC	Polar-orbiting launches, Taurus, Pegasus, Titan IV, Titan II, Atlas IIAS, Delta II, UH-1, test support for DoD space and ICBM systems, commercial launches, ballistic missile and aeronautical systems, NASA, launch R&D tests, range operations for DoD	Y	Y	Y	N	ND	Y	Y	Y
Buckley AFB	CO	AFSC	Missile warning	Y	Y	Y	Y	ND	Y	Y	Y
Peterson AFB	CO	AFSC	Missile warning, Space surveillance	Y	Y	Y	Y	ND	Y	Y	Y
Schriever AFB	CO	AFSC	Command and control of DOD and allied nations' satellites	Y	Y	Y	Y	ND	Y	Y	Y
Dover AFB	DE	AMC	C-5	Y	Y	Y	N (0.12)	ND	Y	Y	Y
Eglin AFB	FL	ACC, AFMC	F-15C, F-15D, A-10, F-15A, F-15C, F-15D, F-15E, F-16C, F-16D, F-117, HH-68	Y	Y	Y	Y	ND	Y	Y	Y
Hurlburt Field	FL	AFSOC	AC-130H, AC-130U, C-41A, EC-137D, MC-130H, MH-53M, UH-1	Y	Y	Y	Y	ND	Y	Y	Y
MacDill AFB	FL	AMC	C-37, KC-135	Y	Y	Y	Y	ND	Y	Y	Y

Attainment Status for Criteria Pollutants at AF Installations (Continued)

				NAAQS Attainment (Y) /NonAttainment (Value)							
Base	**State**	**MAJCOM**	**Weapon System**	**CO Y < 9ppm**	**Lead Y< 1.5**	**NO2 Y < 0.053ppm**	**Ozone 1-hr Y < 0.12ppm**	**Ozone 8-hr ppm ND=Not detected or no data**	**PM-10 Y < 50ug**	**PM-2.5 Y < 15ug**	**SO2 Y < 0.14ppm**
Patrick AFB	FL	AFSC	Launch, range operations for DoD, Titan IV, Atlas II, Delta II, US Navy Trident test support, Shuttle program support, NASA and commercial space launches	Y	Y	Y	Y	ND	Y	Y	Y
Tyndall AFB	FL	ACC, AETC	BQM-34,	Y	Y	Y	Y	ND	Y	Y	Y
Moody AFB	GA	ACC, AETC	HC-130, HH-	Y	Y	Y	Y	ND	Y	Y	Y
Robins AFB	GA	ACC, AFMC	E-8C	Y	Y	Y	Y	ND	Y	Y	Y
Andersen AFB,	GUAM	PAF	—					ND		Y	
Hickam AFB	HI	PAF	—	Y	Y	Y	Y	ND	Y	Y	Y
NAS Keflavik	ICELAND	ACC	HH-60					ND		Y	
Mountain Home AFB	ID	ACC	B-1B, F-15C, F-15D, F-15E, F-16C, F-16CJ, F-16D, KC-135R	Y	Y	Y	Y	ND	Y	Y	Y
Scott AFB	IL	AMC	C-9, C-21	Y	Y	Y	**N**	ND	Y	**N (17)**	Y
Kadena AB, Japan	JAPAN	AFSOC	MC-130H, MC-								
McConnell AFB	KS	AMC	KC-135	Y	Y	Y	Y	ND	Y	Y	Y
Barksdale AFB	LA	ACC	B-52H	Y	Y	Y	Y	0.09	Y	Y	Y
Hanscom AFB	MA	AFMC	—	Y	Y	Y	**N**	ND	Y	Y	Y
Andrews AFB	MD	AMC	C-9, C-20, C-	Y	Y	Y	**N (1.13)**	0.097	Y	**N (15.1)**	Y
Ft. Meade	MD	ACC	—	Y	Y	Y	**N (0.14)**	0.093	Y	**N (15.6)**	Y
Whiteman AFB	MO	ACC	T-38, B-2	Y	Y	Y	Y	ND	Y	Y	Y
Columbus AFB	MS	AETC	T-1, T-37, T-38	Y	Y	Y	Y	ND	Y	Y	Y
Keesler AFB	MS	AETC	C-21	Y	Y	Y	Y	ND	Y	Y	Y
Malmstrom AFB	MT	AFSC	Minuteman III ICBM, UH-1	Y	Y	Y	Y	ND	Y	Y	Y
Pope AFB	NC	ACC, AMC	A-10, OA-10, C-130	Y	Y	Y	Y	ND	Y	Y	Y
Seymour Johnson AFB	NC	ACC	F-15E	Y	Y	Y	Y	ND	Y	Y	Y
Grand Forks AFB	ND	AMC	KC-135	Y	Y	Y	Y	ND	Y	Y	Y
Minot AFB	ND	ACC, AFSC	B-52H, Minuteman III	Y	Y	Y	Y	ND	Y	Y	Y
Offutt AFB	NE	ACC	E-4B, OC-135C, RC-	Y	Y	Y	Y	ND	Y	Y	Y
McGuire AFB	NJ	AMC	C-141, KC-10	Y	Y	Y	**N**	ND	Y	Y	Y
Cannon AFB	NM	ACC	F-16C, F-16D	Y	Y	Y	Y	ND	Y	Y	Y
Holloman AFB	NM	ACC	AT-38B, F-117A	Y	Y	Y	Y	ND	Y	Y	Y
Kirtland AFB	NM	AETC	MC-130H, MC-130P, MH-53, UH-1	Y	Y	Y	Y	ND	Y	Y	Y
Nellis AFB	NV	ACC	A-10, F-15C, F-15D, F-15E, F-16C, F-16D, HH-60, RQ-1A	Y	Y	Y	Y	ND	Y	Y	Y
Wright–Patterson AFB	OH	AFMC	—	Y	Y	Y	Y	ND	Y	**N (16.1)**	Y

Attainment Status for Criteria Pollutants at AF Installations (Continued)

				NAAQS Attainment (Y) /NonAttainment (Value)							
Base	State	MAJCOM	Weapon System	CO Y < 9ppm	Lead Y< 1.5	NO2 Y < 0.053ppm	Ozone 1-hr Y < 0.12ppm	Ozone 8-hr ppm ND=Not detected or no data	PM-10 Y < 50ug	PM-2.5 Y < 15ug	SO2 Y < 0.14ppm
Altus AFB	OK	AETC	C-5, C-17, KC 135	Y	Y	Y	Y	ND	Y	Y	Y
Tinker AFB	OK	ACC,	E-3B, E-3C	Y	Y	Y	Y	ND	Y	Y	Y
Vance AFB	OK	AETC	T-1, T-37, T-38	Y	Y	Y	Y	ND	Y	Y	Y
Charleston AFB	SC	AMC	C-17					ND		Y	
Shaw AFB	SC	ACC	F-16C, F-	Y	Y	Y	Y	ND	Y	Y	Y
Ellsworth AFB	SD	ACC	B-1B	Y	Y	Y	Y	ND	Y	Y	Y
Arnold AFB	TN	AFMC	—	Y	Y	Y	Y	ND	Y	Y	Y
Brooks AFB	TX	AFMC	—	Y	Y	Y	Y	ND	Y	Y	Y
Dyess AFB	TX	ACC, AMC	B-1B, C-130	Y	Y	Y	Y	ND	Y	Y	Y
Goodfellow AFB	TX	AETC	—	Y	Y	Y	Y	ND	Y	Y	Y
Kelly Field,	TX	ACC	—	Y	Y	Y	Y	ND	Y	Y	Y
Lackland AFB	TX	AETC	—	Y	Y	Y	Y	ND	Y	Y	Y
Laughlin AFB	TX	AETC	T-1, T-37, T-38	Y	Y	Y	Y	ND	Y	Y	Y
Randolph AFB	TX	AETC	T-1, T-6, T-37, T-38, T-43	Y	Y	Y	Y	ND	Y	Y	Y
Sheppard AFB	TX	AETC	AT-38, T-38, T-37	Y	Y	Y	Y	ND	Y	Y	Y
RAF Mildenhall, UK	UK	AFSOC	MC-130H, MC 130P, MH-								
Hill AFB	UT	ACC, AFMC	F-16C, F-16D	Y	Y	Y	Y	ND	N (63)	Y	Y
Langley AFB	VA	ACC	F-15C, F-15D	Y	Y	Y	Y	0.087	Y	Y	Y
Fairchild AFB	WA	AETC, AMC	UH-1, Aircrew survival training, KC-135	N	Y	Y	Y	ND	N (54)	Y	Y
McChord AFB	WA	AMC	C-17, C-141	Y	Y	Y	Y	ND	Y	Y	Y
F.E. Warren AFB	WY	AFSC	Minuteman III, Peace-keeper ICBMs, UH-1	Y	Y	Y	Y	ND	Y	Y	Y

Source: http://www.epa.gov/air/data/geosel.html and http://www.epa.gov/air/nonattn.html

REGULATORY RESOURCE: DEPARTMENT OF DEFENSE (DOD) CLEAN AIR ACT (CAA) AND CLEAN WATER ACT (CWA) SERVICES STEERING COMMITTEE (SSC)

The Clean Air Act (CAA) and the Clean Water Act (CWA) Services Steering Committee (SSC) have been established to assist the Department of Defense (DoD) with cost-effective implementation of the CAA and CWA statutes and regulations to achieve sustained compliance at DoD installations.

Pages 16 to 18 provide a listing of current CAA and CWA SSC members, respectively. These senior military or civilian officials of the Army, Air Force, Navy, Marine Corps, and Defense Logistics Agency have responsibilities for their air quality management program and the ability to recommend resources and policy affecting air quality issues to appropriate authorities within their Service or DoD component. Representatives from non-DoD Federal agencies/departments also participate in the SSC meetings and serve as members of subcommittees and workgroups.

Both these groups maintain a subcommittee folder on the Denix DoD Menu Home page at: http://*www.denix.osd.mil/denix/DOD/working/CAASSC/about.html* and http://*www.denix.osd.mil/denix/DOD/working/CWASSC/about.html*. For Further information regarding the DoD CAA SSC, please contact Mr. Terry Bowers, CNON456G at 703-602-4769. For further information regarding the activities of the CWA SSC, please contact Mr. Jay Shah at HQ AF/ILEVQ at 703-607-0120.

Continued From Page 6

Engine Test NESHAP Final Rule (40 CFR 63 Subpart PPPPP)

The final rule contains emission control requirements for major HAP source facilities that have new or reconstructed engine test cell stands which are used for testing uninstalled internal combustion (IC) engines with a rated power of 25 hp (19KW) or more. An affected source is defined as the collection of all equipment and activities associated with engine test cells/ stands used for testing uninstalled stationary or uninstalled mobile (motive) engines located at a major source of HAP emissions. The SSC was instrumental in establishing the broad definition of affected source, which will minimize the impact of this rule because it will make it harder for an existing facility to undergo reconstruction. The proposed rule defined the affected source as each individual test cell or stand. The SSC submitted a comment developed by Hill AFB recommending the broad definition that appeared in the final rule.

The final rule is very clear in that it does not apply to test cells/ stands located at area HAP source or existing test cells/ stands. New or reconstructed uninstalled IC engine test stands exclusively test engines with a rated power of less than 25 hp (19kW) are not subject to this rule, except for an initial

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notification. The rule also exempts combustion turbine engines test cells/stands and rocket engine test cells/stands. Portions of the affected sources used in research and teaching activities at facilities that are not engaged in the development of engines or engine test services for commercial purposes and portions of the affected source operated to test or evaluate fuels (such as knock engines), transmissions, or electronics are also exempt from this rule.

The final rule will have no upfront impact to DoD facilities since it only affects new and reconstructed affected sources that are constructed or reconstruct after May 14, 2002. This rule may affect facilities upon the addition of test cells/ stands). If one or more new test stands that tests IC engines rated 25kw or more were constructed at a major HAP source that does not have any other test stands, then the stands would be regulated as a new affected source. If one or more new test stands were constructed at a major HAP source that had other test stands and/or existing test stands were actually reconstructed, all of the test stands at the facility would be regulated as a reconstructed affected source if the cost of the new and/or reconstructed stands met the monetary threshold for reconstruction considering all of the test stands on the facility.

Reinforced Plastic Composites Production NESHAP: Final Rule (40 CFR 63 Subpart WWWW)

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This rule affects certain plastic composite production facilities that are located on major HAP sources. This rule affects both reinforced and non-reinforced plastic composite production. Reinforced composite production is limited to operations in which reinforced and/or nonreinforced plastic composites or plastic molding compounds are manufactured using thermoset resins and/or gel coats that contain styrene to produce plastic composites.

The rule has exemptions for use of less than 1.2 tons/yr of styrene-containing resins and gel coat, repair of reinforced plastic composites, and use in research and development facilities. The rule also contains special exemptions for production resins and gel coats that must meet military specifications. These resins are allowed to meet the organic HAP limit contained in that specification. The rule also does not impact mold sealing and release agents, mold stripping and cleaning operations, prepreg materials, and non-gel coat surface coatings. Within, DoD, this rule is anticipated to primarily impact Shipyards.

For further information regarding these rules or other NESHAP related questions, please contact Mr. Drek Newton, SSC HAP Subcommittee Chair, at 805-982-3903 or at newtonda@nfesc.navy.mil.

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LEADERSHIP: THE FORMATION AND TRANSFORMATION OF THE AIR FORCE MATERIEL COMMAND (AFMC)

"The leader of today is the one who asks questions, listens carefully, plans diligently and then builds consensus among all those who are necessary for achieving the goals. The leader does not try to do it by himself or herself. The leader gets things done by helping others to do them.

As a leader, your job is to be excellent at what you do, to be the best in your serving people. You not only exemplify excellence in your own behavior, but you also translate it to others so that they, too, become committed to this vision."

Dr. James G. Roche, Secretary of the Air Force

July 1, 1992 - Secretary of the Air Force, Donald Rice, announced that the Air Force Systems Command and The Air Force Logistics Command would be inactivated and the Air Force Materiel Command would be activated at Wright-Patterson Air Force Base, Ohio

1992 – 1995: General Ronald Yates

AFMC's first commander, Gen Yates was faced with the challenge of making Integrated Weapons System Management (IWSM) a reality. He introduced the Command Management Framework (CMF) to focus to the command's five primary mission areas: 1) product management; 2) support and industrial operations; 3) science and technology; 4) test and evaluation; and 5) base operating support.

- AFMC's Lean Logistics program began transitioning the Reparable Supply System from a structure based on consumption projection to one driven by actual requisitions and aircraft availability goals (1993).
- Budget reductions forced leaders to temporarily accept a procurement selection process called weapon system banding. Under Project Reliance banner, AFMC's science and technology researchers worked with their DoD counterparts to combine redundant research programs (1994).

1995 – 1997: General Henry Viccellio, Jr.

Gen. Viccellio, Jr. took command of AFMC, eight days before the 1995 BRAC Commission recommended closing McClellan Air Force Base, Calif., including the Sacramento Air Logistics Center, and eliminating the San Antonio ALC as a part of its proposed realignment of Kelly AFB, Texas. The Air Force devised another option called "workload competition" for Sacramento ALC and San Antonio ALC.

- Acquisition reform was fast becoming an institutionalized DoD strategy, and USAF headquarters-sponsored process improvements were being studied and adopted across the commands. This included the first applications of the "Lightning Bolt" acquisition initiatives and introducing commercial standards and specifications (1995).
- Elements of the depot repair enhancement program and the contractor repair enhancement program were deployed. These programs would bring fundamental change to the ALCs and their contractors' repair facilities - speeding up the repair process meant that AFMC could save money by buying and storing fewer spare parts (1996).
- DoD published Vision 21, a blueprint for restructuring and revitalizing the services' numerous laboratories and test centers, and the command responded accordingly. By fall, plans were well advanced for merging the Armstrong, Phillips, Rome and Wright Laboratories into a single organization called the Air Force Research Laboratory (1996).
- AFRL's Headquarters was activated at Wright-Patterson AFB, Ohio, and the formal consolidation followed six months late (1997).

1997 – 2000: General George Babbitt

AFMC'S third commander, Gen. Babbitt, introduced the command to the terminology and practices of the contemporary business world. He believed modern commerce methods - if applied appropriately - could make the command as efficient and effective as possible. Cost management, rather than budget management, was to become the preferred focus. AFMC program officials were encouraged to look to the cost of their products instead of the cost of their processes. Accountability received renewed attention and AFMC commanders were asked to report the financial health of their organizations on a regular basis.

- Command Management Framework was restructured and five mission element boards were replaced with eight "Business Areas," each under the direction of a chief operating officer. Six of those areas supported the command's external customers: science and technology, test and evaluation, information services, product support, supply management and depot maintenance. The other two, information management and installations and support, served internal customers (1997).
- Air Force Development Test Center was redesignated as the Air Armament Center and the 377th Air Base Wing was realigned under that product center, and the Human Systems Center was realigned under the Aeronautical Systems Center at Wright-Patterson. In addition, the Cataloging and Standardization Center was closed, even as AFMC continued to reduce its presence at both Kelly and McClellan locations (1998).
- Gen. Babbitt testified before Congress about the hidden cost of chronic spares underfunding - a crippling effect he called "the bow wave (1999)."

2000 – Present: General Lester Lyles

When Gen. Lester Lyles assumed command in April 2000, he signaled his intent to follow through with much of the "business approach" his predecessor initiated. However, he also recognized that shifting mission boundaries were affecting AFMC's central role in managing acquisition - especially in the space and command and control arenas - and that repeated science and technology budget reductions had undermined the command's preeminence in aerospace research and development.

- AFMC was repositioned in five key focus areas: Studies and analyses, modeling and simulation, aging systems, leveraging commercial technology and responsiveness to customer needs (2000).
- Space and Missile Systems Center was transferred to the Air Force Space Command (2002).
- The Collier Trophy-winning Global Hawk reconnaissance vehicle entered its engineering, manufacturing and development phase. Lockheed Martin's X-35 won the Joint Strike Fighter competition. The Joint Direct Attack Munition and the T-6 primary trainer entered full production, and the F-22 air superiority fighter and the Joint Air-to-Surface Standoff Missile got approval for low-rate initial production status (12 month period beginning Feb 2001).
- Continuing to combat international terrorism. All achievements had to be kept in perspective with the terrible events of September 11, 2001, and the subsequent actions taken in Afghanistan and elsewhere by the U.S. and its coalition partners.
- Latest Quadrennial Defense Review, and Defense Department leadership's increasingly frequent reference to a new and still vaguely defined concept called "Transformation."

Source: AFMC Leading Edge Magazine

THE MONITOR ON INTERNET

This issue of the MONITOR is available on the Internet at the ASC site (http://www.engineering.wpafb.af.mil/esh/news/news.htm#monitor). The current issue of the MONITOR is in a Portable Document Format (PDF) file which requires a reader program for viewing or downloading. The Adobe Acrobat reader is available for downloading at no cost.

HISTORICAL PERSPECTIVE: EXCERPTS FROM INTERVIEWS WITH AIR FORCE MATERIEL COMMAND (AFMC) POLLUTION PREVENTION INTEGRATED PRODUCT TEAM (HQ AFMC P2IPT) BRANCH CHIEFS

1993 – 1995: Lt Col Brian McCarty - Excerpts of Interview with The MONITOR (1995)

- "Pollution prevention can be viewed as a logistics support issue similar to reliability which was a big issue in the 70-80's. I think pollution prevention is following a similar trend. We're now ramping up pollution prevention to where it will be institutionalized in the near future. In the last year, we have made tremendous strides and the pieces of the puzzle have started to come together. This year at HQ AFMC, we have leveraged pollution prevention dollars to support weapon system pollution prevention projects, such as the Coatings Technology Integration Office (CTIO) and the Joint Group on Acquisition Pollution Prevention (JG-APP) initiative."
- The JG-APP initiative evaluates HAZMAT industrial substitutes on processes at contractor sites that impact Air Force programs and then leverages these solutions across the appropriate weapon systems and program managers. This initiative is a success story for both the Air Force and the Department of Defense and is being headed up by AFMC/DR under the guidance of MGen Bridges."
- "This year, at the HQ AFMC PPIPT level, we have standardized the way we review projects for funding and have institutionalized a mechanism to make these funds available for weapon system pollution prevention. The process has been approved by Air Staff and will be modified as appropriate based on feedback during its implementation."

1995 – 1998: Lt Col Richard Ashworth - Excerpts of Interview with The MONITOR (1998)

- "With the ODS/EPA-17 Reduction, the focus of the P2 Program had been based on pounds reduced. Our focus was to put a face on the P2 Program that was business oriented. In essence, we saw P2 not so much as a program but rather as a mindset. P2 tools and tactics that focus on source reduction represent a smart way of doing business by identifying the best decisions related to environmental management. Our new initiative of achieving Compliance through Pollution Prevention (CTP2) provides such a driver and is in alignment with General Babbit's efforts to bring a business based approach to AFMC."
- "…focusing on pounds reduced does not provide a meaningful output to the P2 Program. Compliance driven services provide a level of output that can be quantified and unit cost measures established. Currently, AFMC has over 18,000 compliance sites that represent an opportunity to fail with the regulators. In the future, one of the services provided by the P2 program will be to help our customers reduce their compliance burden and liability by focusing P2 initiatives on the 18,000 plus compliance sites."

1998 – 1999: Major Lynn Gemperle - Excerpts of Interview with The MONITOR (1999)

- "Specifically at AFMC, 43% of our business is related to operation and maintenance issues, 35% is related to weapon systems, and 22% of our business addresses compliance through P2. The bottom line is that the AFMC P2 Program directly affects the rest of the Air Force and we need the other MAJCOMs involved in our efforts. The last CWG, hosted at ACC, was an excellent start in bringing together the P2 acquisition, sustainment, and installation communities in the Air Force."
- "My vision is that we need to continue to "tear down the walls" and share resources for the overall benefit of the Air Force. Within AFMC, one of our challenges is to truly marry the installation and weapon system pollution prevention programs. The big bang for the buck will come from new technology implementation and process changes into the weapon system P2 community. Such

technology insertion will have direct impact at the installation level and is inherently tied to our existing CTP2 initiative. From my experience, the BEEs bring a unique perspective to the table and I encourage the community to continue placing resources against ESH/P2 related issues. Such collaborations, across the diverse functional areas, from base, headquarters, and Airstaff level will create the synergy for exciting."

Source: Historical Issues of the MONITOR.

Lt Col Michael Boucher, HQ Air Force Materiel Command, Environmental Quality (HQ AFMC/CEVQ) Branch Chief Speaks With The Monitor

Lt Col Michael Boucher currently manages a $100M Environmental Program as the Branch Chief of the HQ AFMC Environmental Quality Branch (HQ AFMC/CEVQ). Prior to this position, he served as the Air Force Research Laboratory, Pollution Prevention Research & Development Branch Chief and also as the Aeronautical Systems Pollution Prevention Division Branch Chief. Lt Col Boucher holds a BS in chemical engineering, a MSPH in Industrial Hygiene and Environmental Toxicology, and a PhD in Public Health and Environmental Engineering. Since 2000, Lt Col Boucher has been serving as the HQ AFMC P2IPT Branch Chief.

MONITOR: What are some of the specific authorities designated to HQ AFMC/CEVQ?

LT. COL BOUCHER: The responsibilities and challenges of the HQ AFMC/CEVQ Program significantly impact the overall Air Force Environmental Quality Program. HQ AFMC/CEVQ is the largest Environmental Quality Program in the Air Force. We maintain approximately 1.8 million acres of land, mitigate environmental risk from approximately 13,000 permitted air sources, and manage 14.1 million pounds of hazardous waste annually. We also currently manage the only Weapon System Pollution Prevention Program in the Air Force, and thereby take a "pro-active" approach to eliminate environmental burden from existing and future weapon systems. We have been the winner of 21 of 42 Department of Defense (DoD) awards since 1993.

Some of the key designated responsibilities of our program include the following:

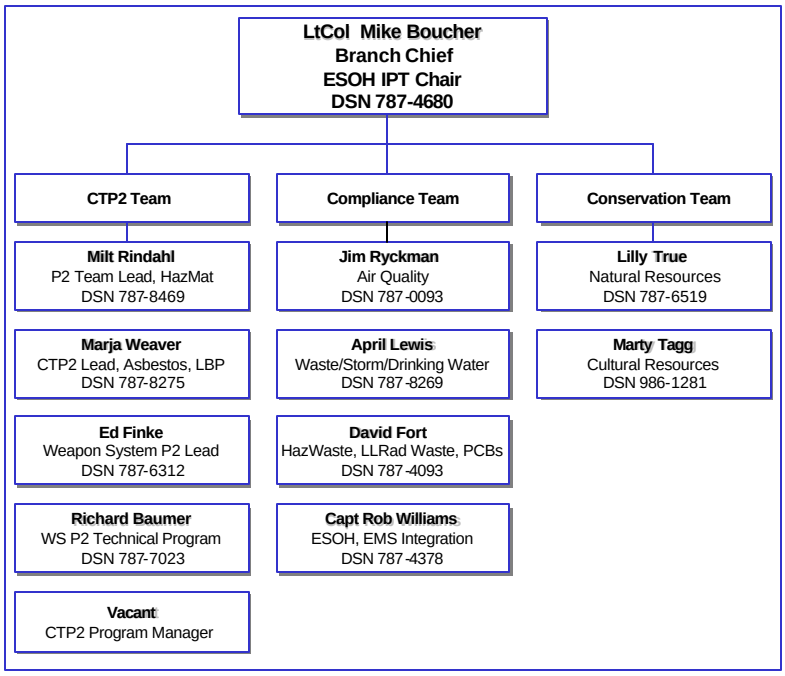
- Providing policy, guidance, and oversight on the technical aspect of the AFMC's EQ Program;
- Validating the EQ Program;
- Coordinating reduction of the environmental quality burden/threats;
- Providing expert consulting services in support of our bases; and
- Chairing various groups, including the ESOH IPT, P2IPT, and the Hazardous Material Management Program (HMMP) Team.

MONITOR: Can you also discuss some of the historical contexts for the integration of the Compliance/Pollution Prevention Branch under Environmental Quality?

LT. COL BOUCHER: About two years ago, we combined the Compliance and Pollution Prevention Branch to provide our bases with "one stop shopping" for technical expertise in order to more effectively and efficiently reduce the compliance cost and risk burden to our mission.

If you look at AFMC's historical metrics in Environmental Management, we have far exceeded our goals. Today, HQ AFMC's outstanding enforcement actions are negligible. By CY 99, we had reduced our

recurring hazardous waste disposal by 50% from the CY 92 Baseline and met the AF's EPA-17/Toxic Release Inventory Goals. As a result, there was a paradigm shift from technology insertion/chemical replacement to compliance burden reduction. Incidentally, this new approach was initiated by HQ AFMC and then translated into the Air Force Compliance Through Pollution Prevention (CTP2) Concept. Today, HQ AFMC/CEVQ is grouped into three teams that include CTP2, Compliance and Conservation. All our media managers in compliance and conservation work closely with the pollution prevention staff, and in turn our pollution prevention staff is more integrated into the Command's compliance burden reduction initiatives. Today, both our weapon system and infrastructure pollution prevention programs are focused on reducing the compliance risk and burden.



MONITOR: What are some the key initiatives that HQ AFMC/CEVQ is currently involved with?

LT. COL BOUCHER: Our major initiative, driving most of our programs, came directly from General Lyles' goal for reducing AFMC's cost burden and becoming more efficient to better support the war fighter. Today, our notice of violations (NOVs) for the command are negligible showing we have a successful program. We need to continue to scrub our requirements and focus on mission essential priorities. Our focus at HQ AFMC/CEVQ is to reduce the environmental burden (cost and liability). Our CTP2 is one effort to achieve this goal. Our weapon system pollution prevention program is also focusing on transitioning those technologies that will translate into savings throughout AFMC and the entire Air Force.

MONITOR: What do you see as some of the challenges as you implement these initiatives?

LT. COL BOUCHER: Let me start by saying that the Environmental Team has done a great job of maintaining compliance. The challenge as we focus on reducing environmental burden is that the Environmental Team needs to evolve its role from being a "mission stopper" to a "mission supporter" in the decision making process. To become a mission supporter, we have to provide options/solutions to mitigate the environmental impact on the AF mission.

I believe our weapon system pollution prevention programs and those individuals that support these programs at the bases are the key players in providing solutions in support of the mission. This includes identifying potential ESH risks to the mission and the associated solutions to solve high-risk items in a cost effective manner.

MONITOR: How has your experience as the Air Force Research Laboratory Pollution Prevention Branch Chief and as the Aeronautical Systems Center Pollution Prevention Branch Chief influenced your decisions and impacted your vision as the CEVQ Branch Chief?

LT. COL BOUCHER: Looking back at the 1990's, I think it was the decade of cultural change that had a tremendous impact on pollution prevention and the integration of ESH into acquisition and maintenance processes. Today, we have the Center Leadership at all the Air Logistics Centers, the acquisition community, and at Air Staff understand the Environment, Safety, and Health (ESH) is a concern to be addressed during the weapon system life cycle. The ESH concept has been integrated into the key Air Force processes. We have a long list of successful technologies that have been inserted into AF manufacturing and maintenance processes, including IVD Aluminum and currently HVOF to replace cadmium and chromium plating, respectively. We have reduced VOC emissions from engines and lowered the VOC content of paint coatings. Not only have these successes been of value to the Air Force, they have a tremendous commercial value and hence are helping the nation, as a whole.

MONITOR: What do you see as some of the remaining challenges and how is your office supporting these challenges?

LT. COL BOUCHER: As I mentioned earlier, the weapon system pollution prevention program is efficient and well established. The challenge lies in that the military is faced with dwindling resources and, as a Command, we have to "transform" our work practices to ensure that the Air Force can budget for new acquisitions.

In this environment, we have to increase the success of our demonstration/validation efforts. This means, selecting those projects with the greatest mission impact and maximizing the effectiveness and efficiency of these projects.

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One of the ways our office is supporting this challenge is through our participation in, and leadership of, the AFMC Center Working Group (CWG). As a community, we leverage multiple bases, multiple weapon systems and multiple commands through this platform. This group asks the tough questions to ensure the proper criteria for project evaluation are met rather than taking a shotgun approach. The projects that are strategically smart, yield quick, predictable benefits are the ones that we are looking at executing. To keep track of our successes, at the Command, we have established a Technology Transition Team to focus on our inefficiencies and improve our success rate. We have found that technology implementation occurs when we have properly coordinated between the weapon system pollution prevention team and the process owner. We also need to bring visibility of the benefits of our investments in these projects to Senior Leadership.

MONITOR: How can the weapon system pollution prevention community and/or the Air Force as a whole address these challenges?

LT. COL BOUCHER: To begin with, I think that the weapon system pollution prevention community, which basically is a small cadre of government personnel, has undertaken a huge responsibility. The motivation, duty, and passionate pursuit of solutions of this community is second to none. Where we have been successful to date in transitioning technologies, these folks have taken many hits on the path to success. However, they have persevered and addressed the technology challenges.

In today's environment, we need the pollution prevention team to get the word out about alternative environmental technologies and insert the requirements for these technologies into the mission planning and programming cycle. We need the support of the weapon system pollution prevention community to help us accurately identify the costs and the risks associated with our future investments in pollution prevention technologies.

AIR FORCE MATERIEL COMMAND POLLUTION PREVENTION PROGRAM ENHANCES TECHNOLOGY TRANSFER

Air Force Materiel Command's (AFMC's) Pollution Prevention Integrated Product Team (P2-IPT) funds demonstration/validation (Dem/Val) of promising pollution prevention (P2) technologies that reduce cost and risk for the Single Manager and Depot Process Owner. The ultimate goal of the Dem/Val projects is to prove the technologies for implementation. Incorporating these technologies into existing business practices minimizes Environmental, Safety, and Occupational Health (ESOH) risks and burden to AFMC and Air Force operations.

To date, AFMC has made a significant investment in the Dem/Val of P2 technologies and has successfully transitioned many of these technologies into AF weapon systems and depot processes.

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A key factor to the success of these Dem/Val Projects has been the endorsement from Senior Leadership to support technology insertion through a myriad of programming strategies. AFMC has initiated procedures to establish a streamlined structure that facilitates endorsement of all funded Dem/Val projects.

The new technology transfer initiatives focus on ensuring that stakeholders are fully aware of and support these technologies from their inception, through to the Dem/Val phase, and into implementation. Demonstration of support must be acknowledged at every level engaged in evaluating, planning, or

programming for implementation of these new technologies. The new business practices developed ensure sound project support during the Dem-Val and subsequent phases of the P2 technology transition process.

Project Managers are now required to obtain endorsement from the appropriate individual(s) with change authority over processes and weapon systems. One of the most important considerations in Dem-Val project approval for funding by the P2-IPT now involves the level of support they are willing to commit to ensure seamless transitioning of the technology into operation upon successful completion of the Dem-Val.

For further information regarding the AFMC Technology Transfer Program, please contact Ms. Linda Willis, HQ AFMC/LGP-EV at DSN 986-3679 or Mr. Ed Finke, HQ AFMC/CEVQ at DSN 787-6312.

HQ Air Force Materiel Command's Logistics Environmental Branch (AFMC/LGP-EV) is Transitioning Laser Technology to Support Air Force Depot Operations

Headquarters Air Force Materiel Command Logistics Environmental Branch (HQ AFMC/LGP-EV) is the Air Force lead in executing joint service pollution prevention projects across Department of Defense (DoD) depots and weapon systems. Ms. Debbie Meredith, AFMC/LGP-EV Branch Chief states, "One of the focus areas for my office is to identify pollution prevention technologies that will improve the maintenance activities at our Air Logistics Centers (ALCs) and associated weapon systems. In recent years, our teaming with Air Force Research Laboratory (AFRL) has been critical to the success of this effort."

Currently, HQ AFMC/LGP-EV and Air Force Research Laboratory, Acquisition Systems Support Branch (AFRL/MLSC) are demonstrating and validating an Environmental Security Technology Certification Program (ESTCP) and HQ AFMC Pollution Prevention Integrated Product Team (P2IPT) funded project for a handheld portable laser coating removal system. Stakeholders to this project include all the Air Force Air Logistics Centers, numerous Air Force weapon system programs, Army, Marines, Navy, and National Aeronautics Service Administration (NASA).

"We are convinced that lasers are a wave of the future", said Tom Naguy, AFRL/MLSC Branch Chief. This project is the beginning of AFRL's effort to insert laser technology into the overall Air Force depaint strategy. The potential benefits to the maintenance community include that handheld laser technology avoids time consuming masking steps in the depainting process by. Additionally, laser technology has the potential for use on materials that can be easily damaged by conventional stripping (e.g. composite materials). My experience at AFRL is that we are the most successful in our technology development efforts, when we first identify a requirement, prototype the technology, and then work directly with our customers to demonstrate, validate, and transition the technology to full implementation. The handheld portable laser coating removal system is one such example."

The prototype for this project was started by AFRL/MLSC in 1998, based on requirements identified through the Environmental Development Planning process. In 2000, AFRL/MLSC teamed with HQ AFMC/LGP-EV to further baseline the prototype technology requirements and demonstrate/validate the technology to full transition.

Four laser technologies have been downselected for the initial demonstration/validation, which is currently being conducted at Wright Patterson Air Force Base. AFRL/MLPJ through LHMEL is demonstrating the

operational capabilities of four different lasers, including two Neodymium Yttrium Alumina Garnet (Nd:YAG) laser cleaning machines capable of producing 120 watts and 80 watts of average power, a diode laser cleaning with power capabilities reaching 250 kilowatts average power, a Carbon Dioxide (CO_2) laser with an average power of 520 watts.

The Preliminary Design Review (PDR) for this project was conducted in 2002 and gave the stakeholders a "hands-on-experience" with the four lasers. According to Richard Bucchi, OO-ALC/TIEM, "We are very interested in this technology at Hill AFB. We are continually identifying new opportunities for its use at the logistics center. For example, the F-16 Antennas often have to be replaced during maintenance activities at a cost of $3,000 each. With the handheld laser, these antennas can be stripped and reused, resulting in savings that will pay for the laser within one year."

Ms. Debbie Meredith concludes, "We anticipate the testing phase to be completed by 2003 and the final procurement specification and technical order (TO) change completed by 2005. My office is currently addressing both the operational and safety concerns associated with the use of the technology in the field and creating a technical order to address these issues. Our next milestone is to showcase this technology to our customers for additional feedback.

For additional information regarding this effort, please contact Ms. Debbie Meredith, HQ AFMC LGP-EV at DSN 785-7505.

Update on Non-Chrome Coating Application on Air Force Weapon Systems

"Who would have thought a decade ago that non-chromated primers could be qualified and flying on Air Force weapon systems? Today, the F-35 plans to use non-chrome primer, the C-17 has approved the use of non-chromated primer on specific components, the C-130J, U-2, and F-22 are currently using non-chromated primer, and the F-15, F-16, and the C-130 are still conducting ongoing qualification testing," states Ms. Debbie Meredith, Headquarters Air Force Materiel Command, Logistics Environmental Office (HQ AFMC/LGP-EV) Branch Chief.

Chromated coatings pose a significant environmental and logistics burden to Air Force and aerospace manufacturing and maintenance operations. Hexavalent chromium is a suspected carcinogen. In 1993, the Occupational Safety and Health Administration (OSHA) was petitioned to promulgate an emergency temporary standard (ETS) to lower the Permissible Exposure Limit (PEL) for chromium to 0.5ug/m^3 as a weighted average. After reviewing the petition, OSHA denied the request for an ETS and has initiated the rulemaking process to lower the standard.

"Our long term strategic objective," states Ms. Meredith, "is to provide a technology solution set to our customers to reduce the logistic footprint associated with environmental, safety, and health (ESOH) burden. Our ongoing initiative to reduce chrome from Air Force coating systems is one such example."

"Although there are several aircraft flying with non-chromated primer, upon conclusion of the Joint Group on Pollution Prevention (JG-PP) Nonchromated Primer for Exterior Aircraft Project, the AF decided to conduct additional testing on a corrosive prone aircraft prior to final implementation of the demonstrated alternatives," states Mr. Steve Finley, HQ AFMC/LGP-EV Program Manager. "As a result, we began a

project to demonstrate/validate the downselected alternatives on the outer moldline of the KC-135. Tinker AFB has just coated a KC-135 with a non-chrome primer. This aircraft will be stationed at Hickam ANG, HI which is a corrosion prone environment and hence an excellent test bed. The data collected from this test will help in the decision process to transition non-chrome coatings on aircraft exterior throughout the Air Force."

Elimination of chromium primer from the aircraft interior has been identified as an Air Force requirement during both manufacturing and maintenance operations. HQ AFMC/LGP-EV is currently leveraging existing data from the JG-PP Nonchromated Primer for Exterior Aircraft Project and has established Simulated Aircraft Structures (SAS), used by the structural maintenance community, as a test bed for evaluating potential non-chromated primer alternatives for interior application. "The first inspection of the SASs will be conducted at Long Beach CA and Coco Beach FL respectively in the July 2003 timeframe," states Ms. Susan Misra, HQ AFMC/LGP-EV Program Manager.

"Other examples of where we are leveraging data to provide multiple solution sets to our customers includes our efforts on investigating Low/No VOC and nonchrome systems for the ICBM support equipment." said Ms. Susan Misra. "For this project, we are leveraging some of the results and test data for the JG-PP Low/No VOC and Nonchromate Coating System for Support Equipment Project for which the Air Force is the lead Agency."

"We are also conducting testing and evaluation of non-chromium pre-treatment and chromium primers against chromium pre-treatments and non-chromium primers," said Steve Finley, "in order to determine where in the coating system we could eliminate chrome without adversely impacting corrosion protection. This gives our customer an alternative solution set if the OSHA standard is revised in the near-term."

For additional information regarding HQ AFMC/LGP-EV's current initiatives on non-chrome coating applications, please contact Ms. Susan Misra at DSN 787-3498 and Mr. Steve Finley at DSN 787-3498.

U-2 Uses Non-Chromated Primer

In January 1995, the U-2 program, at the direction the U-2 SPO at LR-Warner Robbins, embarked on an aggressive effort to replace the chromium based primer and high VOC topcoat used on the aircraft. LM Aero – Palmdale identified Lord Aeroglaze 9741 chromate-free primer and Aeroglaze K3309 low VOC topcoat as the initial test materials for the aircraft. One aircraft was painted in January 1995 using the Lord coating system applied over a chromium conversion coating (Alodine 1200S). The Lord topcoat exhibited too high a gloss so a second A/C was painted in August 1995 using the Lord primer and a topcoat supplied by Deft conforming to MIL-P-85285. Both aircraft were flown in excess of 400 flight hours in varying environmental climates with no corrosion observed. The problems associated with the Lord paint system were that it did not meet the mil-specification (MIL-P-85285B) for corrosion inhibition, and that both topcoats exhibited too high a gloss. In June 1996, LR authorized LM Aero – Palmdale to apply the new paint system to all PDM aircraft.

In August 1996, LR directed LM Aero – Palmdale to implement Spraylats MIL Spec system consisting of chromium-free primer (EWAE217/EWAE118B) and topcoat (EUAK037A.EUAC081B) because the topcoat met the program gloss requirements and the system met the MIL-P-85285B corrosion inhibiting

requirements. From August 1996 to July 1997, the Spraylat paint system was used on U-2 program. Over this span of time, several quality problems were identified with the Spraylat materials. LM Aero – Palmdale identified several batch-to-batch consistency problems such as color and viscosity. LM Aero – Palmdale Engineering worked diligently with the Spraylat paint chemists to resolve these issues but was never able to obtain the desired results. In August 1997, the topcoat was switched to a water-borne polyurethane supplied by Sherwin Williams. During this time, several of the aircraft began to exhibit severe paint adhesion problems and were required to be repainted. An immediate effort was initiated to qualify a new chromium-free/low VOC paint system for the U-2 program as well as to re-evaluate surface preparation procedures and in July 1998, a chromium-free/low VOC paint system developed by Sherwin Williams was selected.

From July 1998 until August 1998, LM Aero – Palmdale Engineering and Sherwin Williams paint chemists worked hand-in-hand to perfect the paint system used on the U-2 with implementation beginning September 1998. In November 1998, ACC took exception to the use of this non-chromated system on an Air Force asset and initiated their own evaluation thru the corrosion control office at Wright Labs. In January 2000, ASC/ACC formally approved the use of the non-chromated system on the U-2 only. The Sherwin Williams' low VOC/chromium-free primer (F93B502/V93V500) and topcoat (E72WA07624382/ V66V580) are now the specified paint system for the U-2 program. These coatings are applied over an Alodine 1200S chromium conversion coating.

LM AERO is currently evaluating the next generation water-borne, polymer filled, polyurethane topcoat in conjunction with the existing primer.

This article was submitted by Jim Bietch, Lockheed Martin.

Lead-Free Solder, an Inevitable Result

(**WPAFB OH**) – By year 2005, lead-free solder on all electronic components could be inevitable.

Japan and the European Union (EU) have been the driving force for the lead-free solder issue.

Japan Electronic Industry Association first adopted lead-free solders in mass production in 1999-2000, first lead-free components were adopted in 2000, and the adoption of lead-free solder in wave soldering was also performed in 2000. The expansion of use of lead-free components and new products began in 2001, which led to general use of lead-free in new products in 2002. Full use of lead-free solders in all new products is scheduled for 2003 and lead solder will be used only exceptionally in 2005, basically for repair.

Japan contends that going to lead-free solder is an advantage in the market place for them. They have determined that the timing of phase-out puts them at a competitive advantage. Japan expects to be lead free in consumer electronics by mid 2003, with their component suppliers expecting to be lead free by June 2003.

EU regulations are banning lead, cadmium, hexavalent chromium, and brominated fire retardants from electronics. The phase-out date for the ban is Jan 2006; however, EU's goal is to convert to lead free solders by 50% of companies by end 2003. US is far behind.

The decision for EU and Japan to go lead-free is driven by politics/marketing strategies and is probably irreversible. Yet the US is far behind; however, and the switch to lead-free solder in aerospace is probably inevitable and EDN Magazine says that lead solder will eventually "become obsolete."

"The problem of component obsolescence has been around for as long as the electronics industry, but it has become a more serious concern in the last decade." "The electronics industry's problem has always been that it designs products whose life cycles regularly far exceed the life spans of the components inside them," states *EDN Magazine*.

"Obsolescence also comes with COTS." "Component obsolescence, however, is the flip side of the COTS coin." "Part of that apparently excessive markup for mil-spec parts goes into funding the parts' long-term availability, beyond the point at which a commercial part would be discontinued. If you use a commercial part, then commercial rules apply: no special treatment and no guarantees of supply outside normal practices. Component obsolescence has been called the number-one problem for designers of long-living systems," states *EDN Magazine*.

The Japanese and European markets are already dictating what the component suppliers will build. Some of the finishes used on the new components are not compatible with tin/lead solder; therefore, lead-free solders will have to be used. As the US military adopts more COTS electronics, lead-free will creep into military programs and will make it too expensive to maintain inventories of both lead and lead-free. Repair with both lead and lead-free will be too difficult to track and accidental mixing will compromise reliability and Operational, Safety, Suitability and Effectiveness (OSS&E). *Certainly reliability and the impact this has OSS&E is an important issue.*

"It seems that the military is the last to switch." "But there may be some reasons." "Some of the lead-free use tin, which forms growths like tiny spikes of conductive crystals, which over long periods can grow to the point they cause short circuits," said Ron Vokits, Technical Expert Adviser for all SOF Programs.

"For commercial industry, that seems acceptable, components, circuits and equipment are replaced on a 3-5 year cycle." "But in the military, the environment is worse, and the equipment is designed to last 20-30 years." "Unless it's broke, or replaced by more capable equipment, we might not be able to tolerate equipment that only lasts a couple of years," said Vokits.

Boeing presented a briefing that included their activities on the lead-free issue. One of the main activities is the partnering with the Joint Group on Pollution Prevention (JG-PP), which is managed by the Joint Pollution Prevention Advisory Board. Boeing says that they are members of a lead-free JG-PP subgroup formed May 2001. The purpose of the group is to demonstrate the feasibility of producing lead-free electronics for the US armed forces. The members include all branches of the military and NASA, Boeing, Lockheed, electronic OEMs, component manufacturers, solder suppliers and repair depots. JG-PP is writing a Joint /Test Protocol (JTP). The JTP will cover (1) manufacture of new electronics, (2) repair of old electronics containing lead, and (3) designing of a test vehicle. The test vehicle will be subjected to environmental screening type testing to comply with Mil STD 810F.

Although the use of lead-free solders in aerospace electronics is probably inevitable, questions still exist concerning the long-term reliability of lead-free solders with certain component types. For example, the leachate data on lead-free solder is scares and the effect of lead contamination on the reliability of lead-free solders is very scarce. Also, the effect of lead contamination on the reliability of lead-free solders is not well understood.

This article was submitted by Lavera Floyd, ASC/LU, Special Operations Forces SPO.

SUMMARY OF MILITARY DOCUMENTS PREPARED BY RAND CORPORATION

MR-1325-AF, *Military Airframe Acquisition Costs: The Effects of Lean Manufacturing*, Cynthia R. Cook, John C. Graser

This study assessed U.S. military aircraft manufacturers' manner in which lean principles have been adopted in each critical phase of military aircraft production. The term "lean manufacturing principle" holds that manufacturers must understand every step in a product's evolution – "value stream". With this knowledge, manufacturers must search for bottlenecks that may impede the production process and incorporate new tools and techniques to improve the quality, while cutting costs. Although lean manufacturing is guided by a number of overriding principles, the manner in which these principles are put into practice varies according to function. The functions that are broken down are Engineering, Tooling, Manufacturing, Quality Control, Purchasing, and Overhead/General/Administrative Costs.

Lean principles were instilled into each function and measured to determine whether production was more efficient. Researchers found that the use of innovative technology and flexible tools diminished cycle times and labor hours during manufacturing. Better quality control practices and the forging of long-term partnerships with key suppliers showed some very promising preliminary evidence that lean principles have the potential to reduce costs while producing better costs. However, the integration of lean principles into military aircraft production remains in a state of flux. None of the manufactures surveyed had yet implemented lean manufacturing practices on a broader scale. Hence, it has been difficult to assess the accuracy of any of the claims made regarding the effects of lean manufacturing on overall aircraft costs. In the interim, the researchers suggest that individual lean initiatives be analyzed and baseline cost estimates discretely adjusted on a case-by-case basis.

MR-1370-AF, *Military Airframe Costs: The Effects of Advanced Materials and Manufacturing Processes*, Obaid Younossi, Michael Kennedy, John C. Graser

Since the Cold War, aircraft contractors and government program managers have long maintained that government cost estimators have consistently overestimated the costs of such systems because of their reliance on outdated forecasting methodologies. The generation of more timely cost-estimating models would thus appear to form the cornerstone of sound acquisition policy. Researchers addressed this issue by updating existing cost-estimating methodologies in the critical area of military airframes. The researchers analyzed how the cost of producing airframe structures varies with material mix, manufacturing technique, and geometric complexity of parts.

In general, researchers found that the costs associated with manufacturing composite airframe parts remain higher than those associated with comparable metal parts despite the start of new manufacturing processes and technologies. They also found that airframe manufacturing hours should decrease as modern fabrication techniques are adapted for use within the airframe industry. The researchers stress two things to keep in mind in any effort to project future costs. First, a high degree of uncertainty associated with future military aircraft production levels. Second, as aircraft designs evolve, and performance requirements become more stringent, aircraft structures may require greater complexity, thereby offsetting some of the cost reductions that have been forecast or achieved to date.

The research will provide cost estimators and engineers with a variety of factors that should prove useful in adjusting or creating estimates of airframe costs based on parametric estimating techniques. At the same time, cost analysts must remain abreast of changes in industry practice if they are to accurately gauge the potential effects of new processes and materials on future airframe design.

MR-1286-AF, *Relating Ranges and Airspace to Air Combat Command Missions and Training*, Albert A. Robbert, Manuel Carrillo, Robert Kerchner, Willard Naslund, William A. Williams

The Air Combat Command (ACC) headquarters asked RAND researchers for assistance in determining its requirements, assessing the adequacy of existing assets, and justifying new or existing assets to allow for the training of Air Force aircrews access to suitable ranges for weapons delivery and dedicated air space for combat tactics. The research team created an analytic structure that links range and airspace requirements to national defense interests and offers a means of comparing these requirements to currently available infrastructure.

Using expert judgment from research staff and experience aircrews, the study team developed a relational database that would serve the analytical needs of the project and also could be updated to reflect changes in training requirements or existing assets and expanded if necessary. The information captured in the database, allowed RAND to assess current ranges and airspace assets used by ACC units. To be useful for training, range and airspace infrastructure must have certain geographical, qualitative, and quantitative characteristics.

The study showed, geographically, there were no significant problems with proximity of ranges and airspace to home bases for air-to-air sorties. There were however, some proximity problems for air-to-ground sorties. Qualitatively, the study found that large proportions of fighter sorties are flown using routes, maneuver areas, and ranges with substandard dimensions. Quantitatively, the research indicated that all almost all fighter bases have access to sufficient range capacity to meet annual air-to-ground sortie requirements, although not necessarily on their own ranges.

MR-1329-AF, *An Overview of Acquisition Reform Cost Savings Estimates*, Mark A. Lorell, John C. Graser

Over the past decade, the Department of the Defense (DoD), using acquisition reform (AR) methods, has sought to achieve significant cost savings either by restructuring government acquisition processes or by altering the relationship between DoD and its prime contractors. RAND researchers were tasked to survey AR literature to assess the robustness of both anticipated and actual cost-savings claims made to date, and to develop taxonomy to group and compare AR initiatives. They reviewed the relevant literature on three key initiatives.

The first initiative was easing the regulatory and oversight burden to gauge the DoD regulatory and oversight cost premium. Researchers found about a 3 to 4 percent average cost savings. The second initiative was emulating commercial programs to achieve cost savings. The principal goal was to lower costs by offering contractors incentives that resemble those found in the commercial arena, also known as cost as an independent variable (CAIV). The key concept requires that cost considerations be accorded a level of priority equal to, if not greater than, that of system performance or schedule. These AR programs have not yet entered full scale. The third and final incentive was cost savings through multiyear procurement. In multiyear procurement, the DoD would be able to purchase more than one year's supply of a production article through a single contract, thereby allowing for more efficient use of contractors' resources, and allowing for strategic relationships between primes and subcontractors.

The RAND researchers concluded that, while published estimates in the literature do not yet support the development of adjustment factors for technical cost models, some rules can be generated that might be of use to future cost estimators. These documents are available at http://www.rand.org.

Name	Description	Web Link
Department of Defense (DoD)		
DENIX	The Defense Environmental Network Information Exchange is the premier environmental site for the Department of Defense and part of its overall information management program (DECIM). DoD web site access requires registration which can be done on line.	https://www.denix.osd.mil
Hazardous Technical Information Services (HTIS)	Hazardous Technical Information Services (HTIS) serves the **DoD community** by providing a Hazardous Materials Helpline Answer Service and a Hazardous Materials Technical Bulletin to **encourage compliant management of hazardous materials and wastes**. HTIS is a service of the Defense Logistics Agency located at the Defense Supply Center Richmond (DSCR), Richmond, VA.	http://www.dscr.dla.mil/htis/htis.htm
Military Item Disposal Instruction	The Military Item Disposal Instructions (MIDI) system is a database application designed to provide instructions and methods of destruction for the disposal of hazardous and nonhazardous items. This program, which requires specific access, allows the user to search items by National Stock Number or part number. Operated by the U.S. Army Hazardous and Medical Waste Program.	http://chppm-www.apgea.army.mil/hmwp/
Environmental Protection Agency (EPA)		
Environmental Information Mgt System	This is a directory of U.S. Environmental Protection Agency (EPA) and other public sector environmental information resources.	http://www.epa.gov/eims/index.html
Envirofacts	U.S. EPA relational database that integrates data from four major EPA program systems: permit compliance system (PCS), CERCLIS, TRIS, RCRIS.	http://www.epa.gov/enviro/
Enviro$ense	The U.S. EPA's pollution prevention forum for all levels of government, researchers, industry, and public interest groups.	http://es.epa.gov/
U.S. EPA Protection Division	The Division works with businesses, organizations, governments, and consumers to reduce emissions of the greenhouse gases that contribute to global climate change by promoting greater use of energy efficient and other cost-effective technologies. The Division also works to improve understanding of the more potent greenhouse gases and options for sequestering carbon dioxide.	http://www.epa.gov/cpd.html
U.S. EPA WWW Server	Contains basic information about the EPA, press releases, EPA Journal, a calendar of events, etc. EPA's Home Page and basic starting part for accessing the rest of EPA via the Internet.	http://www.epa.gov/
U.S. EPA's Air Facility Subsystem–AFS	In 2001, EPA changed the Aerometric Information Retrieval System (AIRS) to a database that is solely related to tracking the compliance of stationary sources of air pollution with EPA regulations: the Air Facility Subsystem (AFS). Contains several databases with information about air pollution in the United States and various World Health Organization (WHO) member countries.	http://www.epa.gov/Compliance/planning/data/air/afssystem.html
SAGE–Solvent Alternatives Guide (U.S. EPA)	Provides information on solvent and process alternatives for parts cleaning and degreasing. Includes a comprehensive listing of existing and new cleaning technologies, ideas for minimizing waste, listing of state technical assistance providers, and a process conversion checklist.	http://clean.rti.org/

Name	Description	Web Link
Department of Energy (DOE)		
Alternative Fuels Data Center (AFDC) - National Renewable Energy Lab., U.S. DOE	The AFDC collects operating information from vehicles (in programs sponsored by the Alternative Motor Fuels Act) running on alternative fuels, analyzes those data, and makes them available to the public. Data is also available for the Biofuels Information Center and the Clean Cities program.	http://www.afdc.nrel.gov/
Ames Laboratory's Environmental & Protection Sciences Program	As part of the U.S. Department of Energy, Ames Laboratory EPSCI is developing technological solutions to the problems of contamination resulting from nuclear weapons production. Features of this site include a library and Internet "Green" Pages.	http://www.epsci.ameslab.gov/
U.S. DOE – Energy Efficiency and Renewable Energy Network	Offers hundreds of pages of information from the Office of Energy Efficiency and Renewable Energy. This online library of resources offers news and archives about conservation techniques and developments in the world of energy technology.	http://www.eren.doe.gov/
U.S. DOE - Office of Environmental Management (EM)	This DOE site features information and links to environmental management and pollution prevention at DOE. A direct link to pollution prevention information can be accessed with: Access: http://www.em.doc.gov/polprev.html	http://www.em.doe.gov/index4.html
EPIC (Energy Pollution Prevention Information Clearinghouse)	The purpose of EPIC is to facilitate the exchange of U.S. DOE pollution prevention information between DOE sites, state and local governments, and private industries. It includes a file listing of DOE-specific P2 information and a calendar of upcoming DOE-sponsored conferences, meetings, and training events related to pollution prevention.	http://epic.er.doe.gov/epic/
Office of Industrial Technologies (OIT) Home Page	OIT is part of the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy. It creates partnerships among industry, trade groups, government agencies, and other organizations to research, develop, and deliver advanced energy efficiency, renewable energy, and pollution prevention technologies for industrial customers.	http://www.oit.doe.gov/
Office of Industrial Technologies (OIT) Chemicals Industry Team	As part of OIT's Industries of the Future strategy, the Chemicals Industry Team was established as a partnership between OIT and the U.S. chemical industry to maximize economic, energy, and environmental benefits through research and development of innovative technologies.	http://www.oit.doe.gov/chemicals/
U.S. Department of Energy's Technical Information Services (TIS)	The Environment, Safety, and Health (ES&H) Technical Information Services (TIS) is a computer-based information system designed for safety and health professionals. Several databases are on TIS including Safety Performance Measurement System (SPMS), OSHA standards, and ES&H technical publications.	http://www.eh.doe.gov/portal/home.htm
DOE - Los Alamos National Laboratory	Provides Pollution Prevention information and links to other P2 resources.	http://www.lanl.gov/worldview/
Department of Labor - Occupational Safety and Health Administration (OSHA)		
OSHA National Office Home Page	Access to fact sheets and OSHA Standards and other documents. Also contains links to other Health and Safety sites.	http://www.osha.gov
OSHA Salt Lake City Technical Center	Information on Chemical Sampling information and other technical aspects of occupational safety and health. Contains a helpful search program for searching applicable documents by key words.	http://www.osha-slc.gov

Upcoming Events

Date	Event	Location	POC/Phone Number/E-mail	Website
Apr 23-24 2003	F-16 Environmental Network/ Environmental Working Group (EWG)	Lackland AFB TX	paul.hoth@hill.af.mil 801-775-4889	
Apr 28 – May 2 2003	International Conference on Metallurgical Coatings and Thin Films	San Diego CA	icmctf@mindspring.com 703-266-3287	http://www.avs.org/conferences/icmctf/call/2003/
May 3-8 2003	46th Annual Society of Vacuum Coaters Technical Conference	San Francisco CA	505-856-7188	http://www.svc.org/TC/TC03/Prelim.html
May 11-15 2003	Society for the Advancement of Materials and Process Engineering (SAMPE®) 2003	Long Beach CA	Online Registration: http://www.sampe.org/ISSEprereg.html 800-562-7360	http://www.sampe.org/ISSEgeneral.html
May 13-15 2003	National Aeronautical Systems & Technology Conference & Exhibition	Dayton OH	nmundy@ndia.org 703-247-9476	www.nastc2003.org
Jun 2-6 2003	The Propulsion Environmental Working Group Summer 2003 Mtg	New Orleans LA	PEWG Management Office 937-255-1966 x3309	http://www.pewg.com/Calendar/CalendarR.htm
Jun 16-20 2003	FAA In-flight Icing / Ground De-icing International Conf	Chicago IL	724-772-8547	http://www.sae.org/calendar/eid/overview.htm
Jun 23-25 2003	Air & Waste Management Association 96th Annual Conference & Exhibition	San Diego CA	Online registration: http://www.awma.org/ACE2003/reg/default.asp?id=641483285 1-800-270-3444 x3127	http://www.awma.org/ACE2003/
Jun 23-26 2003	7th Annual Green Chemistry & Engineering Conference	Washington DC	greenchem2003@acs.org 202-452-2138	http://chemistry.org/meetings/greenchem2003.html
Jun 29 – Jul 2 2003	2003 Int'l Society for Industrial Ecology 2nd Int'l Conf	Ann Arbor MI	isie2003@umich.edu 203-436-4835	http://www.css.snre.umich.edu/
Jul 7-10 2003	33rd International Conf on Environmental Systems (ICES)	Vancouver BC, Canada	kthomson@sae.org 724-772-7120	http://www.sae.org/calendar/ice/index.htm
Jul 28-31 2003	StormCon: The North American Surface Water Quality Conf and Exhibition	Marco Island FL	info@stormCon.com 805-682-1300 x129	http://www.forester.net/sc.html
Aug 11-14 2003	Joint Services P2 and Hazardous Waste Management Conference	San Antonio TX	p2info@ndia.org 703-247-2582.	http://www.p2-hwmconference.com/
Sep 8-12 2003	2003 Aerospace Congress and Exhibition: Creating the Next Century of Flight	Montreal QU, Canada	roth@sae.org 724-772-4081	http://www.ace2003.sae.org/ace/
Sep 28 – Oct 2 2003	35th International SAMPE Technical Conference	Dayton, OH	bensontolle@earthlink.net 937/255-9070	http://ps.udri.udayton.edu/SAMPE/ISTC/default.htm
Oct 12-15 2003	11th International Conf of the Greening of Industry Network: Innovating for Sustainability	San Francisco CA	greening@greeningofindustry.org 508-751-4607	http://www.greeningofindustry.org/
Oct 27-30 2003	DoD Maintenance Symposium & Exhibition	King of Prussia PA	agrech@sae.org 724-772-4078	http://www.sae.org/calendar/dod/index.htm
Oct 28-30 2003	COATING 2003	Indianapolis IN	aygoyer@one.net 513-624-9988	http://www.thecoatingshow.com
Dec 2-4 2003	Partners in Environmental Technology Technical Symposium & Workshop (SERDP/ESTCP)	Lake Buena Vista, FL	partners@hgl.com (703) 736-4548	http://www.serdp.org/symposiums/symposiums.html